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Filed : November 21, 2001

REMARKS

Claim 1 has been amended to clarify the invention and correct informalities. In Claim 1, the phrase “a side chain type liquid crystal polymer comprising a monomer unit (a) ... and a monomer unit (b)” has been changed to “a side chain type liquid crystal polymer of a monomer unit (a) ... and a monomer unit (b)”. This amendment is merely for clarification because the liquid crystal polymer disclosed in the specification contains both the monomer unit (a) and the monomer unit (b) in the same molecule. This is clearly distinguishable from the mere mixture of a liquid crystal polymer and a non-liquid crystal polymer. Claim 9 has been amended to correct informalities.

Claims 14-17 have been withdrawn from consideration as being directed to a non-elected species. If generic claims are allowed, rejoinder of Claims 14-17 is respectfully requested.

A substitute specification and a marked-up version thereof have been resubmitted herewith since the substitute specification filed August 21, 2003 was not entered due to the Examiner’s allegation of introduction of new matter to the disclosure.

The amendments neither raise the issue of new issue nor the addition of new matter to the application. Applicant respectfully requests entry of the amendments and reconsideration of the application in view of the amendments and the following remarks.

Specification

The substitute specification filed 21 August 2003 has not been entered on the basis that it does not conform to 37 CFR 1.125(b) and (c). Applicant has resubmitted herewith a substitute specification in compliance with 37 C.F.R. §1.125(b) and (c) in which the material considered new matter by the Examiner has been canceled. It is respectfully requested that the substitute specification be entered.

Rejection of Claims 1, 2, 9 and 10 Under 35 U.S.C. § 112

Claims 1, 2, 9 and 10 have been rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. In Claims 1 and 9, the term “solely” has been deleted from “capable of homeotropic alignment by solely heating”, thereby obviating the rejection. Thus, Applicant respectfully requests withdrawal of the rejection.

Rejection of Claims 1, 2, 9 and 10 Under 35 U.S.C. § 102

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Claims 1, 2, 9 and 10 have been rejected under 35 U.S.C. § 102(b) as being anticipated by US 5,730,900 (Kawata). The claims as amended herein could not be anticipated by Kawata as explained below.

Regarding Claim 1, the Examiner has asserted that Kawata discloses “coating a side chain type liquid crystal polymer comprising a monomer unit (a) containing a liquid crystalline fragment side chain and a monomer unit (b) containing a non-liquid crystalline fragment side chain on a substrate on which a vertical alignment film is not formed” on column 4, lines 57-59. However, this interpretation is incorrect. Kawata discloses that when the film is employed as liquid crystal of a liquid crystal cell of LCD, the resultant LCD is free from use of an orientation film (see column 4, lines 57-59). This means that if the liquid crystal film obtained is used for the crystal cell, a vertical alignment film is not needed for the crystal cell, but not that a vertical alignment film is not needed to manufacture a liquid crystal film itself.

The Examiner has asserted that Kawata discloses “said liquid crystal polymer being capable of homeotropic alignment by heating” on column 2, lines 55-62 and column 31, line 64 to column 33, line 3. However, contrary to the Examiner’s assertion, Kawata does not disclose any liquid crystal polymers being capable of homeotropic alignment. Kawata discloses only discotic liquid crystalline polymers. Such discotic liquid crystalline polymers are not capable of homeotropic alignment.

Further, although Kawada discloses liquid crystalline polymer and nonliquid-crystalline polymer (see column 31, line 67), Kawata does not disclose the specific liquid crystal polymer recited in Claim 1. The side chain type liquid crystal polymer used in the present invention is a polymer of a monomer unit (a) containing a liquid crystalline fragment side chain and a monomer unit (b) containing a non-liquid crystalline fragment side chain. That is, the liquid crystal polymer contains both the monomer unit (a) and the monomer unit (b) in the same molecule, which is entirely different from the mere mixture of a liquid crystalline polymer and a nonliquid-crystalline polymer.

The Examiner has asserted that Kawata discloses “after the substrate is coated with the liquid crystal polymer which is in a liquid crystal state, homeotropically aligning the liquid

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crystal polymer by heating; and fixing a resulting homeotropic alignment state of the liquid crystal polymer” on column 4, lines 22-30, column 16, lines 57-64 and column 34, lines 28-45. However, as discussed above, Kawata discloses merely discotic liquid crystalline compounds. The compounds are not homeotropically aligned by heating.

Regarding Claim 2, the Examiner has asserted that Kawata discloses “the method according to claim 1, wherein a material of said substrate is a polymer or glass” on column 39, lines 30-36. However, this interpretation is incorrect. Kawata disclose a polymer or glass as a material of the substrate of the liquid crystal cell (see column 39, lines 30-36), but not as a material of the substrate to manufacture a liquid crystal film.

Accordingly, Kawata fails to disclose every element of the claimed invention. Thus, Claim 1 as well as Claim 2 dependent thereon could not be anticipated by Kawata.

As discussed above, although Kawata discloses discotic liquid crystalline compounds, Kawata discloses neither liquid crystal polymers being capable of homeotropic alignment nor homeotropically aligning the liquid crystal polymer by heating.

Thus, Claim 9 which recites the above significant features, as well as Claim 10 dependent thereon, could not be anticipated by Kawata. Withdrawal of the rejection under 35 U.S.C. § 102(b) is respectfully requested.

Rejection of Claims 1, 2, 9 and 10 Under 35 U.S.C. § 102

Claims 1, 2, 9 and 10 have been rejected under 35 U.S.C. § 102(e) as being anticipated by US 6,379,758 (Hanmer et al.). The claims as amended herein could not be anticipated by Hanmer et al. as explained below.

In the present invention, a side chain type liquid crystal polymer which is capable of homeotropic alignment by heating is applied on a substrate, and then is homeotropically aligned on the substrate by heating. In contrast, in Hanmer et al., a polymerizable liquid crystalline monomer is applied on a substrate, and UV light is applied thereto to polymerize the monomer (EXAMPLE 1A). In Hanmer et al., the monomer is aligned on the substrate before polymerization, whereas in the present invention, the specific polymer is homeotropically aligned on the substrate. Thus, clearly, in Hanmer et al., alignment treatment must be excised on the monomer already applied on the substrate. This technology is equivalent to using a substrate having a vertical alignment film formed thereon. In fact, Hanmer et al. discloses “to

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achieve homeotropic or titled homeotropic, alignment the mesogenic material is preferably coated onto substrates carrying an alignment layer (see column 5, lines 10-12).

In addition, Hanmer et al. does not disclose the specific polymer, i.e., a side chain type liquid crystal polymer of a monomer unit (a) containing a liquid crystalline fragment side chain and a monomer unit (b) containing a non-liquid crystalline fragment side chain as recited in Claim 1.

Accordingly, the processes disclosed in Hanmer et al. are entirely different from the present invention. Hanmer et al. fails to disclose every element of the claimed invention, and withdrawal of the rejection under 35 U.S.C. § 102(e) is respectfully requested.

CONCLUSION

In light of the Applicant's amendments to the claims and the foregoing Remarks, it is respectfully submitted that the present application is in condition for allowance. Should the Examiner have any remaining concerns which might prevent the prompt allowance of the application, the Examiner is respectfully invited to contact the undersigned at the telephone number appearing below.


Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

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Dated: February 9, 2004

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